Miscellaneous Mistletoe Notes, 20–36

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ABSTRACT. The following new species are described and illustrated: *Dendrophthora haberi* Kuijt, *Dendrophthora lacryma-jobi* Kellogg, *Dendrophthora oligantha* Kuijt, *Dendrophthora scopulata* Kuijt, *Phoradendron diminutivum* Kellogg, *Phoradendron kelloggii* Kuijt, *Phoradendron kingii* Kuijt, *Phoradendron roldanii* Kuijt, *Phoradendron triflorum* Kellogg, *Phoradendron websteri* Kuijt, and *Psittacanthus breedlovei* Kuijt. Recombined names include *Dendrophthora densifrons* (Ule) Kuijt, *Dendrophthora fanshawei* (Maguire) Kuijt, and *Dendrophthora intermedia* (Rizzini) Kuijt. The *Dendrophthora obliqua-fendleriana* complex is discussed, as are the recently recombined names *Dendrophthora fendleriana* (Eichler) Kuijt, *Phthirusa podoptera* (Chamisso & Schlechtendal) Kuijt, and *Phthirusa stelis* (L.) Kuijt, including an extended synonymy of the latter.

A number of new species and combinations are presented here in connection with forthcoming regional treatments of the Loranthaceae and Viscaceae of various parts of South America. Additionally, some explanations are provided for the use of certain names in these treatments, since such explanations cannot be given there. Previous installments in this series were published in *Brittonia* (32: 518–529. 1980; and 39: 447–459. 1987). The second author is responsible for species number 24, 28, and 32, the first author for remaining items, including the illustrations.

20. Dendrophthora densifrons (Ule) Kuijt, comb. nov. Basionym: *Phoradendron densifrons* Ule, Notizbl. Bot. Gart. Berlin-Dahlem 6: 292. 1915. TYPE: Venezuela/Guyana. Mt. Roraima, 1900 m, *Ule 8602* (MG not seen).

A very rare species, known from the type and the two following recent collections: Venezuela. Bolívar: Chimantá Massif, Central Section, tributary of E branch of headwaters of Río Tirica, 2185–2210 m, on *Ternstroemia, Steyermark & Wurdack 858* (F, NY); wide valley of SE part of Apakarátepui, 05°19′N, 62°12′W, 2150 m, *Huber & Cleef 13153* (LEA, MYF).

21. Dendrophthora fanshawei (Maguire) Kuijt, comb. nov. Basionym: *Phoradendron fanshawei* Maguire, Bull. Torrey Bot. Club 75: 300. 1948. TYPE: Guyana. Potaro River Gorge below Tukei, *Maguire & Fanshawe 27201* (holotype, NY; isotype, K).

This species is distinguishable from the closely related *Dendrophthora obliqua* (Presl) Wiens by its consistently obovate, rather small, symmetrical leaves, and by its yellowish flowers, which contrast with the spike axis. The collection that was checked for anther morphology is *Irwin et al. 55486A* (F), a specimen corresponding in all details to the type; the anthers are clearly unilocular, as might be expected from its evident similarity to *D. obliqua*.

22. Dendrophthora haberi Kuijt, sp. nov. TYPE: Costa Rica. Puntarenas: Cantón de Puntarenas, Monteverde, cliff edge above Quebrada Máquina, moist forest along Fonseca, Hotel de Montaña and Savage farms, 10°18′N, 84°48′W, 1100–1300 m, on *Drypetes, Haber & Daniel 9904* (holotype, MO; isotypes, CR, LEA). Figure 1.

Caules teretes, percurrentes atque propter inflorescentias terminales dichotomi. Cataphylla basalia 2–4-juga; internodia percurrentia cataphyllis intercalaribus uni- vel bijugis. Folia ad 6.5 × 2 cm, lamina lanceolata, extremitate utraque acute angustata. Planta dioecia; inflorescentia pistillata ad 3 cm longa; pedunculus compositus; internodia fertilia 3 vel 4; flores terni ad septenos pro bractea fertili, triseriati.

Much branched plants with terete stems, the lateral innovations bearing 1 or 2 pairs of foliage leaves and subtended by 2–4 pairs of basal cataphylls, the upper pair at least halfway to the next foliar node; where percurrent internodes, these with

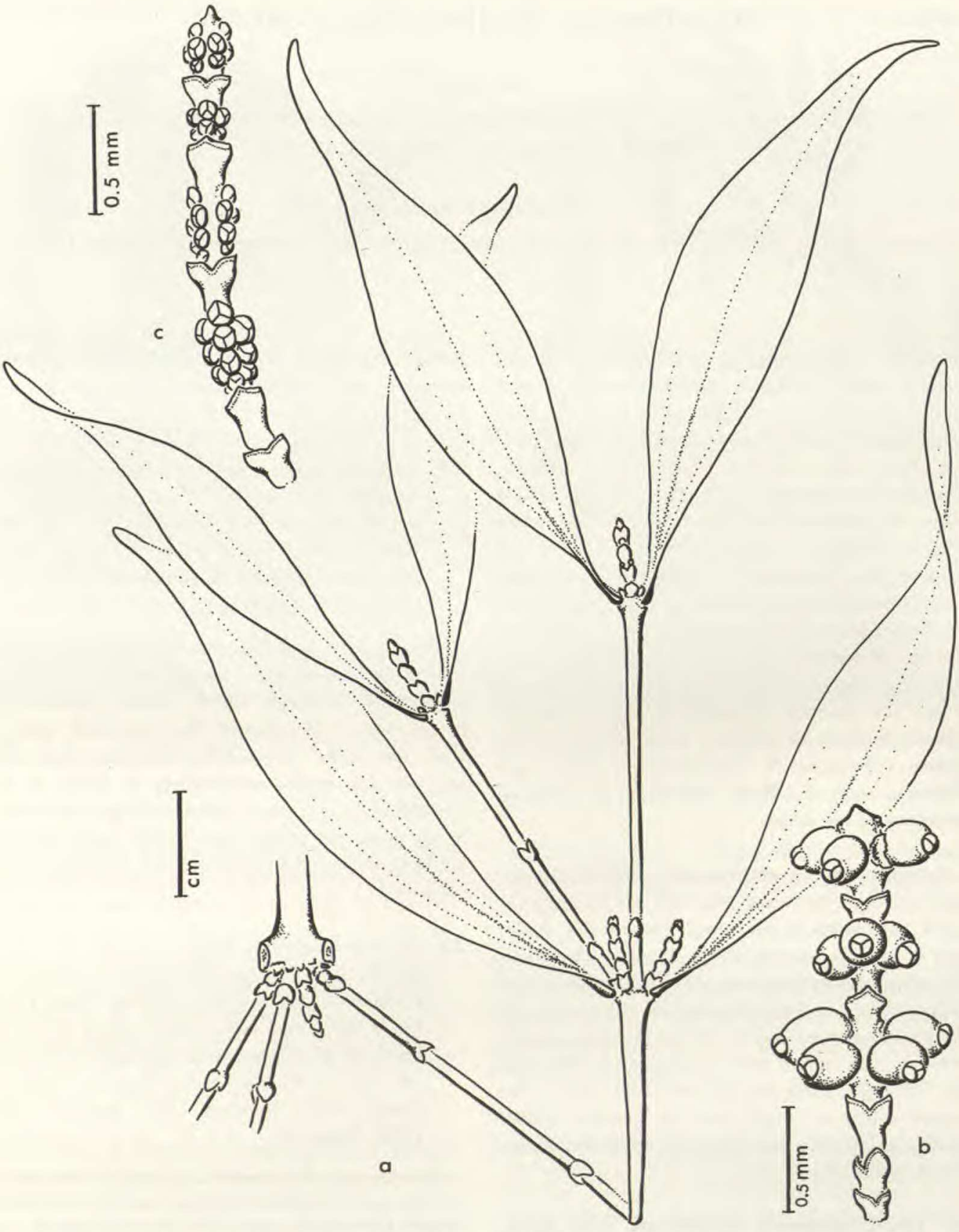

Figure 1. *Dendrophthora haberi* Kuijt. —a, b. Habit and female inflorescence. —c. Male inflorescence. (*Haber & Zuchowski 9495*, 10890, respectively, LEA.)

1(2) pair of intercalary cataphylls 5–7 mm above the foliar node. Leaves to 6.5 × 2 cm, blade narrowly lanceolate, apex and base sharply tapered, petiole indistinct, ca. 2 mm. Venation inconspicuous, midvein associated with 2 long basal veins. Dioecious. Male inflorescence ca. 2 cm long, peduncle 2 mm when simple, 4–5 mm when consisting of 2 sterile internodes; fertile internodes 4, flowers 6–11 per fertile bract, triseriate. Female inflorescence to 3 cm, peduncle compound, sterile

internodes (1)2, followed by 3 or 4 fertile internodes; flowers 3–7 per fertile bract, triseriate, crowded at the tip of the internode. Fruit 2.5 × 3 mm, white, ovoid, perianth members closed.

Notwithstanding some similarity to the South American *Phoradendron laxiflorum* Ule, this species has unilocular anthers and must therefore be assigned to *Dendrophthora*. The general high altitudinal preference of continental *Dendrophthora* is once again confirmed. The species is unique in *Dendrophthora* in combining occasional apical inflorescences (leading to dichotomy) with normal percurrent growth; its overall aspect is one of repeated forking, often with several branches from the (then swollen) node. I am at a complete loss to find close relatives in the genus.

Paratypes. COSTA RICA. **Guanacaste:** Las Nubes, 1 km N of Las Nubes village, 8 km NW of Monteverde, premontane rain forest, 10°22′N, 84°51′W, 1200 m, *Haber & Zuchowski 9495* (CR, LEA, MO). **Puntarenas:** Cantón de Monteverde, cliff edge and descending ridge below Hotel de Montaña, 10°18′N, 84°48′W, 1200–1300 m, on *Ardisia compressa*, *Haber & Zuchowski 10890* (LEA, MO).

23. Dendrophthora intermedia (Rizzini) Kuijt, comb. nov. Basionym: *Phoradendron intermedium* Rizzini, Rodriguésia 18/19: 190. 1956. TYPE: Venezuela. Amazonas: Selvas de Yavita, Alto Orinoco, 128 m, *Ll. Williams 14067* (holotype, VEN).

Amended description: Rather large plants, glabrous, percurrent, internodes to 6 cm long, terete, basal cataphylls 1 pair 3–6 mm above axil, sometimes followed by a second pair 1.5 cm higher, rather small. Leaves to 12 × 6 cm, oblong-elliptical to obovate, apex rounded, base tapering into indistinct petiole 5–10 mm long; venation palmate or nearly so. Dioecious, this plant male. Male inflorescences apparently only lateral, with 1–4 pairs of sterile basal cataphylls, to 4 cm long, the sterile internodes together to 8 mm long, followed by 4 or 5 fertile internodes; flowers ca. 8–15 or more per fertile bract, often triseriate above, at other times entirely biseriate.

It is surprising to find a *Dendrophthora* at this low elevation, but both Elizabeth Kellogg and I have independently confirmed the unilocular nature of the anther. Only the type has come to our attention. The species looks a little like *D. tepuiana* (Steyermark) Kuijt, but it lacks the latter's yellowish cast and, more importantly, has longer and often biseriate inflorescences.

24. Dendrophthora lacryma-jobi E. Kellogg, sp. nov. TYPE: Venezuela. Bolívar: Gran Sabana, ca. 15 km WSW of Karaurín Tepui, at junction of Río Karaurín and Río Asadón (Río Sanpa), 05°19′N, 61°03′W, 900–1000 m, *Liesner 23978* (holotype, GH; isotype, MO). Figure 2.

Planta innovationibus determinatis, floribus congestis in inflorescentiis utque fructibus 3 mm brevioribus luteolis vel cremeis. A speciebus *Phoradendri* differt antheris unilocularis.

Stems flattened to very nearly terete when young; cataphylls (1–)2(–4) pairs on lateral branches only, if 1 pair then 2–7 mm above node, if 2 then the first 1–2 mm above node, the second 5–8 (17) mm above the first, broadly triangular to ovate, flaring. Many specimens with determinate innovations. Leaves with petiole 0–6 mm long; blade elliptic, obovate or oblanceolate, widest at or above the middle, 2.7–7.0 × 1.3–3.0(3.6) cm, the apex rounded, obtuse or truncate, sometimes apiculate, the base cuneate, the nerves basal or inner pair suprabasal, obscure. Inflorescences 1 to 3 per leaf axil or terminal in some innovations, to 2.3 cm long, axis 1–2 mm thick when dry; cataphylls 0–2 pairs, like the bracts fused and flaring to form a short infundibular tube; fertile internodes 3–6; flowers biseriate, 3–7 per bract, crowded, all pistillate or staminate and pistillate flowers intermixed; apical flowers with median perianth member lowermost, lower ones with median perianth member uppermost. Fruits globose, yellowish, much smaller than those of all other species (3 mm vs. 6 mm long); perianth members open, short, spreading, not stiff.

The epithet is in honor of Job Kuijt, authority on mistletoes and monographer of *Dendrophthora*; he will be the one to shed tears over the ultimate circumscription of this species.

This species is superficially similar to *Phoradendron trinervium* (Lamarck) Grisebach and *P. zuloagae* Trelease, but the yellowish fruits that are less than 3 mm long and short, crowded inflorescences mark it as distinct. It appears to grow only on species of *Qualea* (Vochysiaceae).

One specimen, *Vareschi & Foldats 4590* (NY), is unusual in that it has a few, apparently bisexual flowers. Each has only one anther, but the pistil appears to be fully formed.

Paratypes. VENEZUELA. **Bolívar:** Municipio Raul Leoni Macizo Guaiquinima, Cerro Camarón, Arbustal sobre areniscas del Grupo Roraima, 05°41′N, 64°09′W, 800 m, *Fernandez & Aymard 4765* (MO); Gran Sabana, ca. 15 km WSW of Karaurín Tepui, Quebrada Tanuan, 05°19′N, 61°04′W, 950 m, *Liesner*

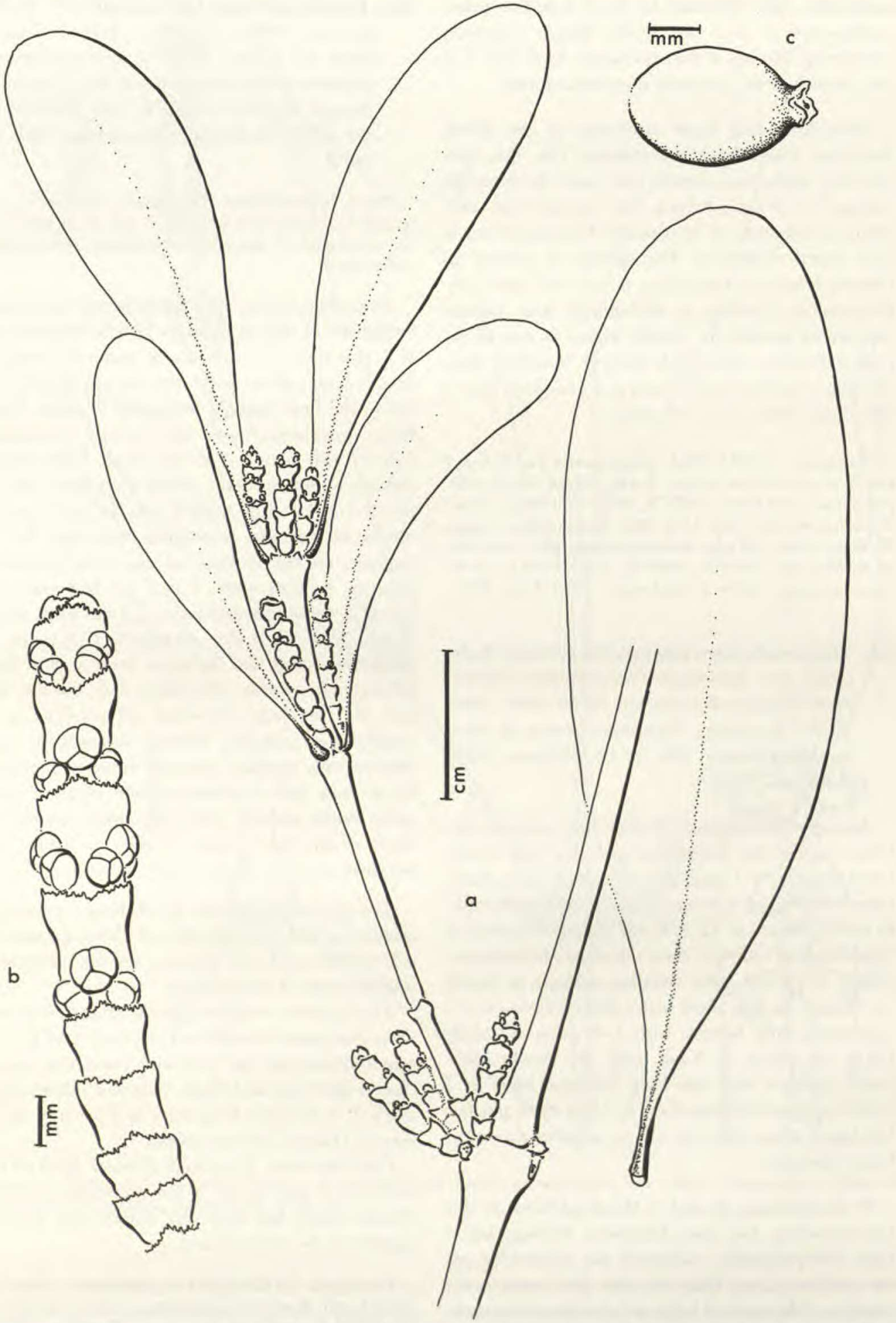

Figure 2. *Dendrophthora lacryma-jobi* Kellogg. —a. Habit. —b. Inflorescence. —c. Fruit. (*Fernandez & Aymard 4765*, MO.)

24109 (GH); Sierra Auraima, en la parte terminal norte sobre el margen oeste del río Paragua, en la zona del raudal de El Perro, 6°32′N, 63°33′W, 400 m, *Steyermark 90843* (NY); cumbre del cerro Guaiquinima, a lo largo del afluente del río Carapo, 1 km río arriba del Salto Szczerbanari, 5°44′4″N, 63°41′8″W, parte sur-oriental del cerro, 730–750 m, *Steyermark et al. 117397* (VEN); al borde de la teraza de Guayaraca, lugar rocoso, seco, 1100 m, Auyantepui, *Vareschi & Foldats 4590* (NY); slope forest Tirepón-tepui, 1200–1250 m, *Wurdack 34047* (NY). **Terr. Fed. Amazonas:** Dpto. Atures, Río Coro-Coro, W of Serrania de Yutaje, 8 km N of settlement of Yutaje, 5°41′30″N, 66°07′30″W, 650–700 m, *Holst & Liesner 3113* (GH, MO); Dpto. Atures, W side of valley of Río Coro-Coro, 8 km NNW of settlement of Yutaje, 05°41′N, 66°08′30″W, 500–1000 m, *Liesner & Holst 21436* (M); Dpto. Atures, 1 to 2 km E of Río Coro-Coro, W of Serrania de Yutaje, 9 km N of settlement of Yutaje, 05°42′N, 66°07′30″W, 500–730 m, *Liesner & Holst 21477* (GH); Río Guainia, savanna on left bank of Cano Caname (right bank of Cano San Miguel just below Limoncito), 120–140 m, *Maguire et al. 41881* (NY); San Carlos de Río Negro, 125 m, *Steyermark & Bunting 102750* (NY); Dpto. Atabapo, Cerro Marahuaca, along branch of Cano Negro, south-central portion of meseta, 3°43′N, 65°31′W, 1140 m, *Steyermark & Holst 130882* (NY).

25. The *Dendrophthora obliqua-fendleriana* question.

In the northern Andes and southern Mesoamerica, we encounter a complex of extremely stout *Dendrophthora* plants with large basal and/or intercalary cataphylls. In Peru and Ecuador, these have unusually large, asymmetrical, acute leaves. In more northerly areas, leaves are smaller and more symmetrical. In both the southern and northern extremes, it is clear that the growth habit is dichotomous in that the shoot tip aborts after an innovation forms a single pair of foliage leaves (see fig. 43 in Kuijt, 1986). However, some of the Venezuelan plants are percurrent rather than dichotomous, and it is to such a plant that the name *Phoradendron fendlerianum* Eichler is attached.

There are a number of serious difficulties in comprehending this complex of plants. The most important, practical one is their fragility; we often cannot be sure whether intercalary cataphylls are present on percurrent stems or whether these occur at all. Even if that problem did not exist, we have at present no way of knowing how variable the percurrent vs. dichotomous feature is; for example, in a related species in Mesoamerica, *Phoradendron robustissimum* Eichler, both types seem to coexist. The plants in question are by no means common, and they seem to exist in highly disjunct populations on tepuis and other mountain peaks. To confound the situation further, several additional names have been applied to elements of this complex. Their authors seem not to have been aware of the morphological complexities involved, and type specimens are not always helpful. A further problem is that a lateral stem at a dichotomy, especially where its partner fails to develop or is weak, may come to occupy a seemingly percurrent position, and very close scrutiny may be needed to understand the situation properly.

The resolution that I propose for the present is the division of most of the complex into two species, one of which is the strictly dichotomous *Dendrophthora obliqua* as described and illustrated in Kuijt (1986, fig. 43; 1978, fig. 6), the other being percurrent and presently known as *Phoradendron fendlerianum*. There are two qualifiers to this solution. First, "*Phoradendron*" *fanshawei* (see species number 21 in the present paper) is clearly a member of the complex, but is here judged to be a distinct unit. Second, I cannot exclude the possibility that the Panamanian plants may eventually have to be recognized as a separate entity. However, I feel that this should be done only after the Colombian situation is more adequately known; it may then be possible to use an existing Colombian epithet such as *guascanum* in Panama. In the meantime, I wish to include the Panamanian material in *D. obliqua*.

Every specific epithet in this complex was first assigned to *Phoradendron*. To the contrary, I am convinced that these plants are more properly placed in *Dendrophthora*; I am assuming that all have unilocular anthers. This is known as a fact for *D. obliqua* (Wiens & Barlow, 1971); for Panamanian plants (Kuijt, unpublished information); and for the type of *P. duidanum* (*Tate 737*; E. Kellogg, unpublished information). Additionally, the consistent preference for high altitude points to this conclusion, although this is not an infallible guide. In consequence, *P. fendlerianum* has recently been assigned to *Dendrophthora* (Kuijt, 1994). I have not, unfortunately, been able to clarify adequately the sex distribution of members of this complex. I speak of *D. obliqua* as being dioecious in Panama and Ecuador (Kuijt, 1978, 1986), but I am not completely certain of the facts elsewhere, especially in Colombia and Venezuela.

In conclusion, I would recognize the following two species and their synonyms:

Dendrophthora obliqua (Presl) Wiens, Taxon 20: 326. 1971. TYPE: Colombia, *Haenke s.n.* (holotype, PR).

Phoradendron guascanum Trelease, Bull. Torry Bot. Club 54: 474. 1927. TYPE: Colombia. Guasca, *Ariste-Josèph B-60* (holotype, US).

There is no indication of intercalary cataphylls in the protologue of *P. guascanum*, and Trelease compares the species to "*Phoradendron obliquum*." The type locality seems to be well beyond the known range of *D. fendleriana*.

Dendrophthora fendleriana (Eichler) Kuijt, Taxon 43: 190. 1994. *Phoradendron fendlerianum* Eichler, Fl. Brasil. 5(2): 129. 1868. TYPE: Venezuela. Tovar, *Fendler 1102* (holotype, P; isotype, MO).

Phoradendron duidanum Trelease, Bull. Torrey Bot. Club 58: 58. 1931. Syn. nov. TYPE: Venezuela. Top of Mt. Duida, dry slopes of Savanna Hills, 4400 ft., *Tate 737* (holotype, NY; isotype, ILL).

Phoradendron duidanum Trelease var. *hymenaeifolium* Rizzini, Rodriguésia 30: 58. 1978. Syn. nov. TYPE: Venezuela. Bolívar: Chimantá Massif, Agparaman-tepui, forested middle slopes near Río Tirica, 1365 m, *Steyermark & Wurdack 1250* (holotype, VEN; isotype, F).

Phoradendron spectabile Rizzini, Rev. Brasil. Biol. 31: 200–202. 1971. Syn. nov. TYPE: Venezuela. Táchira: near Colombia–Venezuela border, below Páramo de Tama, *Steyermark et al. 98433* (holotype, RB; isotype, NY).

Phoradendron spectabile Rizzini var. *altimontanum* Rizzini, Rev. Brasil. Biol. 31: 201. 1971. Syn. nov. TYPE: Same locality as var. *spectabile*, 2750–2950 ft., *Steyermark et al. 98588* (holotype, RB).

Phoradendron tatei Trelease, Bull. Torrey Bot. Club 58: 359. 1931. Syn. nov. TYPE: Venezuela. Mt. Duida, slopes of ridge 25, 5500–6000 ft., *Tate 450* (holotype, NY).

Type material of *Phoradendron fendlerianum* has two to several pairs of conspicuous intercalary cataphylls between successive pairs of foliage leaves and is undoubtedly a *Dendrophthora*, as indicated by its clear similarity to *D. obliqua*; unfortunately, the type is female, and certainty is impossible, the generic distinction largely being one of anther morphology. A virtually identical specimen (Venezuela. Trujillo: Selva nublada virgen entre La Pena y Agua de Obispo, 22–28 km de Carache, 2400–2500 m, *Steyermark 105006*, MO, determined *P. spectabile* by Rizzini), however, is purely male; to confuse matters further, this specimen alternates normal and cataphyllar "internodes" along a percurrent branch. There may or may not be additional differences from *D. obliqua*, such as the simple peduncle of *P. fendlerianum*; my comments and illustration of the spikes of *D. obliqua* for Ecuador are incomplete in this regard, for many plants have two sterile internodes instead of one.

The type of *P. duidanum* has unilocular anthers. Trelease wrote: "scarcely forked," and "cataphylls on all joints"; the holotype clearly shows several percurrent stems with intercalary cataphylls; inflorescences have 2 or 3 sterile internodes at the base.

The type of *Phoradendron spectabile* is male and the species therefore dioecious; the inflorescence peduncle is simple, the leaves very broadly ovate, symmetrical. The protologue speaks of the 2–4 cataphylls as "ad omnia internodia obviae." A nearly identical specimen, *Luteyn et al. 8242* (Venezuela. Aragua, La Victoria–Colonia Tovar road, 11.5 km N of Pie de Cerro, 10°22′N, 67°20′W, MO), is also strictly male and bears at least some percurrent internodes without intercalary cataphylls; it thus originates from the same general area as the type of *D. fendleriana*.

The type of *Phoradendron tatei* is entirely percurrent, with 2 or 3 pairs of intercalary cataphylls; inflorescences seem to bear some sterile basal internodes; the leaves are rather small (to 6 × 3 cm).

26. Dendrophthora oligantha Kuijt, sp. nov. TYPE: Venezuela. Bolívar: Sifontes, Gran Sabana, Kavanayén, en bosquete a orilla de quebrada, cerca del aeropuerto, *Fernandez & Bracamonte 3203* (holotype, PORT; isotype, LEA). Figure 3.

Planta ramosissima, ut videtur succulenta; cataphylla basalia unijuga sub inflorescentiis surculorum brevium lateralium. Folia usque 12 × 7 mm, obovato-elliptica. Inflorescentia ad 7 mm longa, pedunculo 1 mm longo; internodia fertilia 2 vel 3, flores singuli vel terni pro bractea fertili.

Profusely branched, small-leaved species, the leaf-bearing internodes ca. 1 cm long, with minutely papillate surface, apparently succulent when fresh; basal cataphylls one pair on lateral branches, sometimes also one pair of intercalary cataphylls on the node directly below a terminal inflorescence (see drawing), to 3 mm above the base. Leaves to 12 × 7 mm, obovate-elliptical and somewhat fleshy, apex rounded, base tapering into indistinct, flat petiole ca. 1 mm long; venation obscure. Lowest leafy organs in median position. Possibly monoecious, both sexes represented on the same spike? Inflorescence to 7 mm long, peduncle 1 mm long, followed by 2 or 3 fertile internodes, flowers 1 or 3 per fertile bract, deeply sunken in axis, bi- or triseriate; inflorescence commonly in terminal positions at the tip of short branches bearing one pair of expanded leaves. Fruit and male flowers unknown.

Dendrophthora oligantha is a small species with a very distinctive morphology. The smaller innovations have 3 inflorescences at the tip, and these innovations must be shed following flowering or

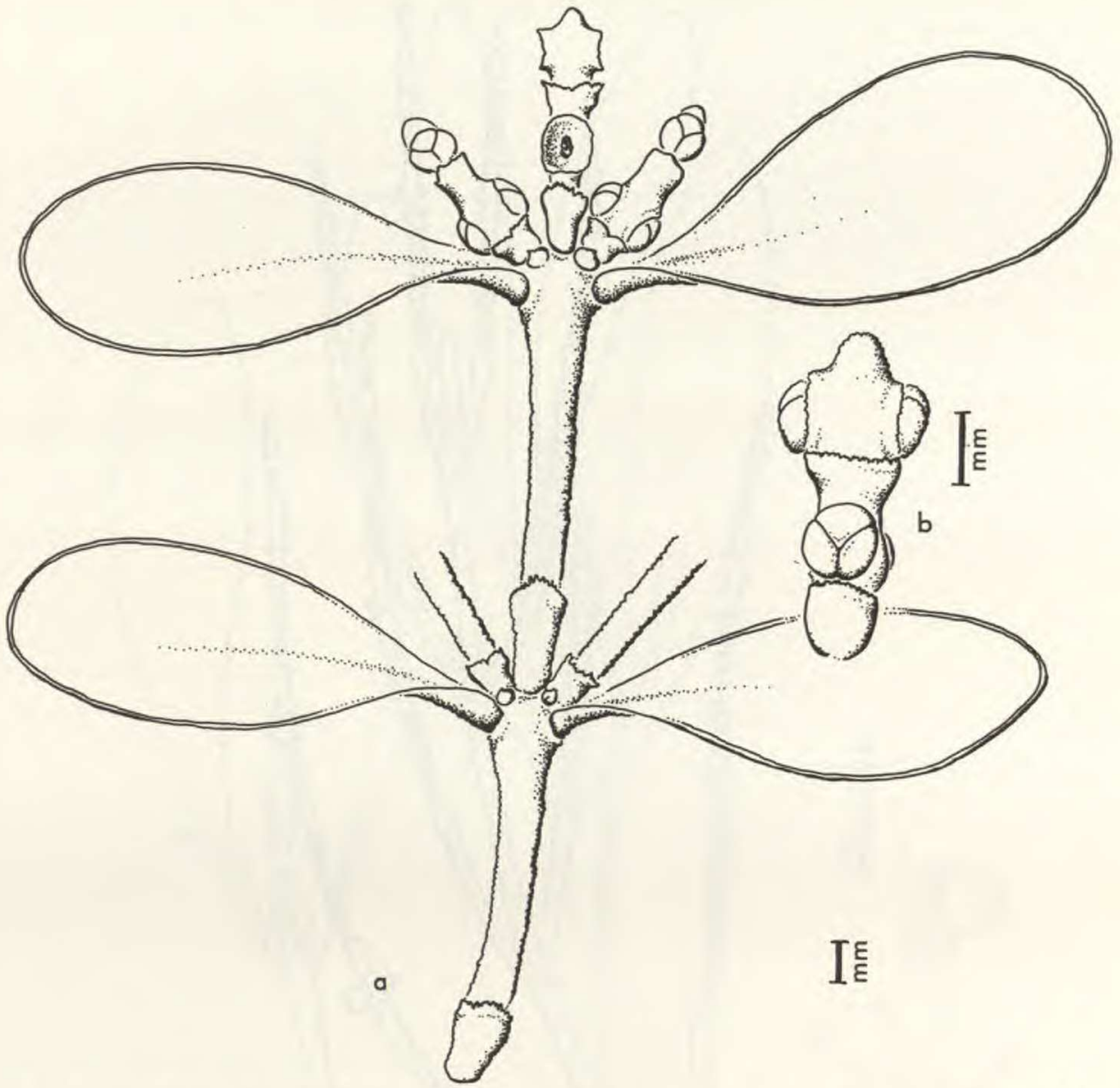

Figure 3. *Dendrophthora oligantha* Kuijt. —a. Habit. —b. Inflorescence. (*Fernandez & Bracamonte 3203,* LEA.)

fruiting. Branches that are percurrent for more than one internode also have a terminal inflorescence, but the latter tends to be flanked by young innovations rather than inflorescences, facilitating further growth of a furcate pattern.

Although no reliable generic placement is possible at this moment, the (male?) flowers seen being immature, the high elevation strongly suggests (but does not prove) the present choice. The habitat of the *Moore et al.* collection (low open woods with moss on tree- and shrub-bases and many shrubs with lichens interspersed in patches) is also very typical of *Dendrophthora.* A more mature plant is needed to ascertain secure generic placement.

Paratype. VENEZUELA. **Bolívar:** Río Tehuanén camp between Kavanayén and Ptari-tepui, 1240 m, *Moore et al. 9698* (VEN).

27. Dendrophthora scopulata Kuijt, sp. nov. TYPE: Honduras. Morazan, in cloud forest, Rancho Quemado above San Juancito, on *Podocarpus oleifolius,* 2100 m, *Williams & Williams 18517* (holotype, F; isotype, US). Figure 4.

Planta gracilis, ramosissima, squamata, monoecia; caules teretes; folia squamiformia 1–2 mm longa, acuta. Inflorescentia ad 7 cm longa, internodiis fertilibus ca. 7, floribus ca. senis pro internodio fertili, uniseriatis, superioribus pistillatis, inferioribus staminatis. Fructus diam. 3 mm, globosus.

Slender, profusely branched, erect plants, squamate. Internodes to 2.5 cm, terete, basal cataphylls none, the lowest scale leaves in median position; prophylls 1 mm, with strikingly fimbriate margin. Scale leaves 1–2 mm, acute and spreading when dry, rarely replaced by a small spatulate to obovate

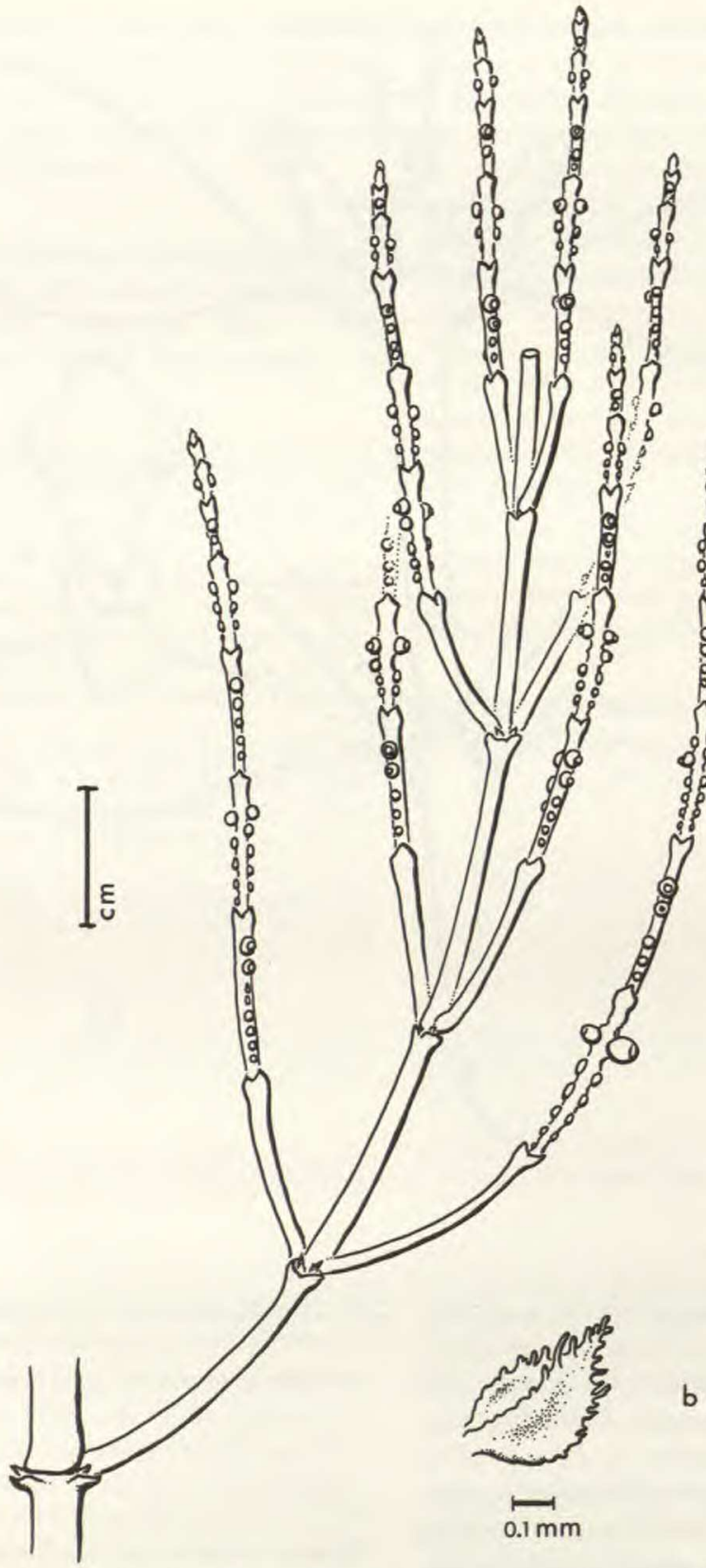

Figure 4. *Dendrophthora scopulata* Kuijt. —a. Habit. —b. Prophyll. (*Williams & Williams 18517*, F.)

leaf 10 × 4 mm. Monoecious. Inflorescence to 7 cm long, slender, peduncle 8–15 mm, followed by ca. 7 fertile internodes becoming progressively shorter upwards; flowers 4–10 per fertile internode, uniseriate, the upper 1 or 2 female, lower ones male. Mature fruit 3 × 2 mm, ovoid to globose, perianth members closed.

This species is closely related to *Dendrophthora squamigera* (Bentham) Kuntze and *D. davidsei* Kuijt, differing in being much larger and more slender, and in having a much larger number of fertile internodes; the other two species rarely have more than 1 or 2–4 fertile internodes, respectively, in Central America.

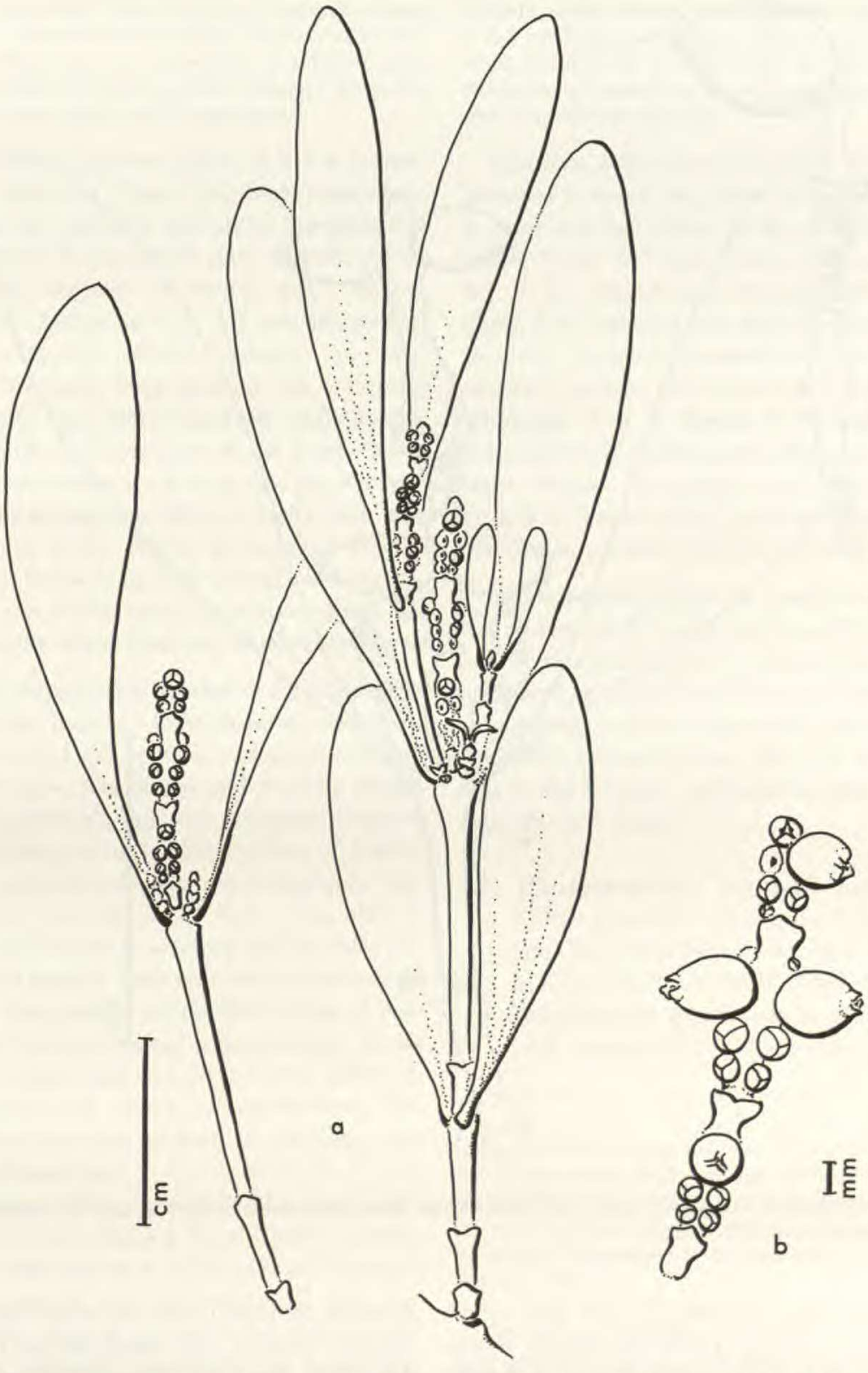

Figure 5. *Phoradendron diminutivum* Kellogg. —a. Habit. —b. Inflorescence. (*Davidse 27772*, GH.)

28. Phoradendron diminutivum E. Kellogg, sp. nov. TYPE: Venezuela. Amazonas: Dpto. Río Negro, Río Pasimoni, between its mouth and its junction with the Río Baria and the Río Yatua, inundated forest, 80 m, *Davidse 27772* (holotype, GH; isotypes, LEA, MO). Figure 5.

Planta cataphylla multo super nodos fert; innovationes determinatae. A *Phoradendro strongyloclado* internodis brevioribus et a *Ph. piperoide* foliis nervi e basi differt.

Stems terete, internodes <3 cm long; cataphylls 1 or 2 pairs on all axes, the first 1 or 2 mm above each node, the second 4–5 mm above the first, broadly triangular, fused or not. Determinate innovations common. Leaves drying yellowish, with petiole indistinct; blades oblanceolate, 2.7–4.8 × 0.9–1.3 cm, the apex obtuse, sometimes apiculate, the base cuneate, the nerves basal or inner two suprabasal, indistinct. Inflorescences 1 or 2 per leaf

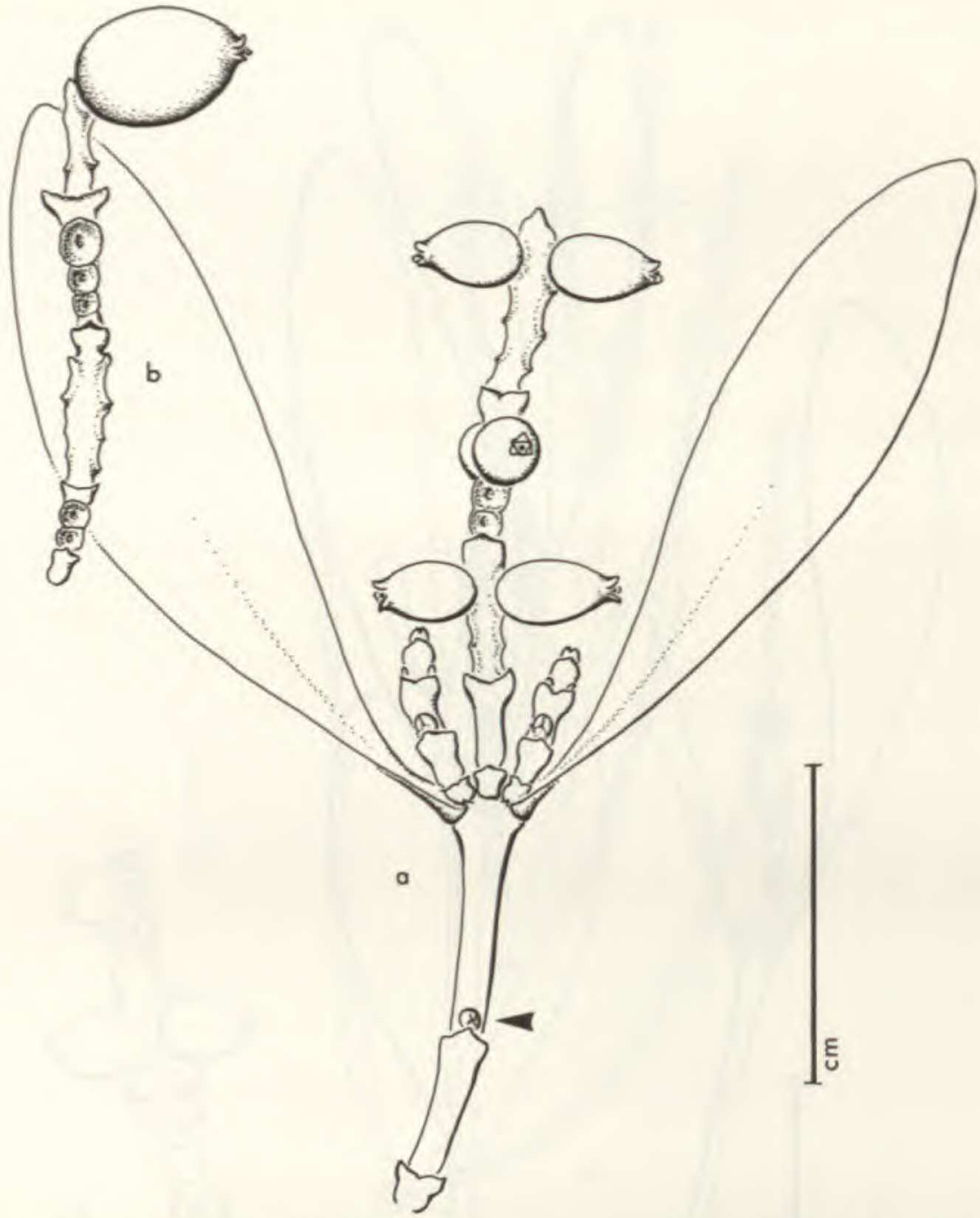

Figure 6. *Phoradendron kelloggii* Kuijt. —a. Habit. Arrow shows inflorescence bud in axil of cataphyll. —b. Inflorescence. (*Colonnello G. 726*, VEN.)

axil, to 1.5 cm long, the axis <1 mm thick when dry; cataphylls lacking, peduncle simple; bracts fused infundibular; fertile internodes 2 or 3; flowers 3 to 6 per bract, biseriate, staminate and pistillate intermixed, apical flower with median perianth member lowermost, lower flowers with median perianth member uppermost. Fruit ovoid when immature; perianth members open, spreading, not stiffly erect.

Known only from the type, this species is distinctive in having cataphylls on all internodes, generally with one pair well above the node. In this respect it is similar to *Phoradendron piperoides* (Kunth) Trelease, but the entire plant is more diminutive and the leaves are much smaller and differently shaped, with basal nerves. *Phoradendron piperoides* never has terminal inflorescences. The short internodes and spreading cataphylls well above the nodes distinguish it from *P. strongyloclados* Eichler.

29. Phoradendron kelloggii Kuijt, sp. nov. TYPE: Venezuela. Amazonas: en la Altiplanicie del Cerro Duida, arriba de la Culebra, 1250 m, *Colonello G. 726* (holotype, VEN). Figure 6.

Planta ramosissima, ad 1 m longa, succulenta, monoecia; caules teretes. Cataphylla basalia 1(–3)-juga. Folia ad

5 × 1.5 cm, lanceolata. Flores staminati aggregati ad partes inferiores internodiorum fertilium; inflorescentiae ad 2 cm longae, axillares necnon terminales ad ramulos, plerumque prope basim bracteis sterilibus unijugis; flores singuli ad ternos pro bractea fertili, uniseriati.

Much branched, glabrous plants 0.5–1 m in size, succulent, internodes 3 cm or less long, terete; basal cataphylls one pair 2–4 mm above the base, frequently followed by one or two pairs of well-spaced cataphylls the highest of which may subtend inflorescences. Leaves to 5 × 1.5 cm, lanceolate, venation obscure but probably palmate, apex and base acute, the latter long-tapering into a slender petiole to 5 mm long. Monoecious, the male flowers concentrated on the lower part of the fertile internodes. Inflorescence to 2 cm long, one per leaf axil but also terminating branchlets, usually with one very low pair of sterile bracts, the entire peduncle 2–3 mm long, followed by 2 or 3 fertile internodes, flowers 1–3 per fertile bract, uniseriate. Fruit 4.5 × 4 mm, broadly ovoid, perianth members reflexed.

This is the third known species of *Phoradendron* with uniseriate flowers. *Phoradendron uniseriale* Kuijt, an unrelated species from Colombia with this inflorescence type, was discovered recently (Kuijt, 1990). In *P. uniseriale*, only the unequivocal structural correspondence to another species of *Phoradendron*, *P. piperoides*, demonstrated its generic status, but in the present case I have been able to dissect the male flower to observe the bilocular anther. The third species with uniseriate flowers is *P. karuaianum* Steyermark, which differs from *P. kelloggii* in not having terminal inflorescences, in its much longer spikes, and in having a very different, ovate-attenuate leaf shape. *Phoradendron karuaianum* has bilocular anthers (E. Kellogg, unpublished information).

Phoradendron kelloggii consists of a succession of innovations, each bearing 2 or 3 pairs of cataphylls below followed by a single pair of expanded leaves. The second and third cataphyll pair frequently (but not always) subtend inflorescences; the innovation is normally terminated by 3 inflorescences, a terminal one, and two in the adjacent leaf axils. New innovations arise in the axils of prophylls of lateral spikes, or in the place of such spikes.

30. Phoradendron kingii Kuijt, sp. nov. TYPE: Mexico. Chiapas: pine-oak forest along route 190, 10 mi. E of Teopisca, in gymnospermous trees, *King 3027* (holotype, NY). Figure 7.

Planta glabra, rigida, sat carnosa, ut videtur monoecia. Internodia media teretia, utraque extremitate compressa; cataphylla basalia unijuga. Folia usque 4.5 × 2.5 cm, obovata, rigida, obtusa, basi angustata. Spica pistillata ca. 1–1.5 cm longa; pedunculus simplex, validissimus; internodia fertili 2 vel 3, flores terni ad internodia inferiora, pauciores ad superiora, bi- vel triseriati. Fructus 3 × 3 mm, perianthium clausum.

Glabrous, stiff, branched plants, rather fleshy, internodes to 4 cm long, often somewhat compressed at each end but terete in the middle; basal cataphylls 1 pair 3–5 mm above axil, stout. Leaves to 4.5 × 2.5 cm, obovate to spathulate, rigid, apex blunt, base tapering into thick, indistinct petiole 3 mm long. Apparently monoecious. Spike 1–1.5 cm, peduncle simple, very stout, ca. 2 mm long, fertile internodes 2 or 3, flowers 3 in lower internodes, fewer above, bi- or triseriate, the apical above each bract female, the lateral ones apparently male. Fruit 3 × 3 mm, deeply sunken in axis, somewhat tubercular, perianth members closed.

Phoradendron kingii is similar to the broad-leaved form of *P. brachystachyum* (DC.) Nuttall (Sonora to Oaxaca) and to *P. spathulatum* Kuijt (Chiapas), both of which are dioecious; basal cataphylls are lacking in the former, while in the latter they are rather inconspicuous. The fruit of *P. spathulatum* is much larger and smooth rather than tubercular as in *P. kingii*.

31. Phoradendron roldanii Kuijt, sp. nov. TYPE: Colombia. Antioquia: Municipio Frontino, Vereda la Fenia, Carretera Nutibara, km 17–32, 6°55′N, 76°18′W, 1000–1200 m, sobre *Phoradendron* sp., *Roldán et al. 861* (holotype, LEA; isotype, HUA). Figure 8.

Planta dioecia, erecta, sparsim ramosa; ramificationes percurrentes; internodia ad 10 cm longa, infra teretia, supra ad nodum maxime expansa. Cataphylla basalia 3-(4-vel 5-)juga, intercalaria unijuga. Folia ad 1.5 × 1.5 cm, sessilia, late ovata. Inflorescentiae staminatae aggregatae ad nodos, pedunculus internodiis sterilibus ad 3 (vel 5) vel nullis; flores usque ad novenos pro bractea sterili, biseriati et triseriati.

Sparsely branched, erect, percurrent, glabrous and yellowish plants, the stout internodes to 10 cm long, terete below, expanding massively above to form a clavate node to 2 cm wide, flattened in the plane of the leaves. Basal cataphylls 3 (4–5) pairs, lower pair axillary, the uppermost pair 1.5 cm above axil; intercalary cataphylls one pair, 2–4 mm above nodal constriction, inconspicuous. Leaves small, to 1.5 × 1.5 cm (–5 cm), sessile, broadly ovate to orbicular, fleshy. Dioecious, the type male. Inflorescences clustered at the internodes, with 0–3(–5) pairs of sterile cataphylls, mostly to 2.5 cm long, with 5–7 fertile internodes, flowers to 9 per fertile bract (the terminal internode with 1–3 flow-

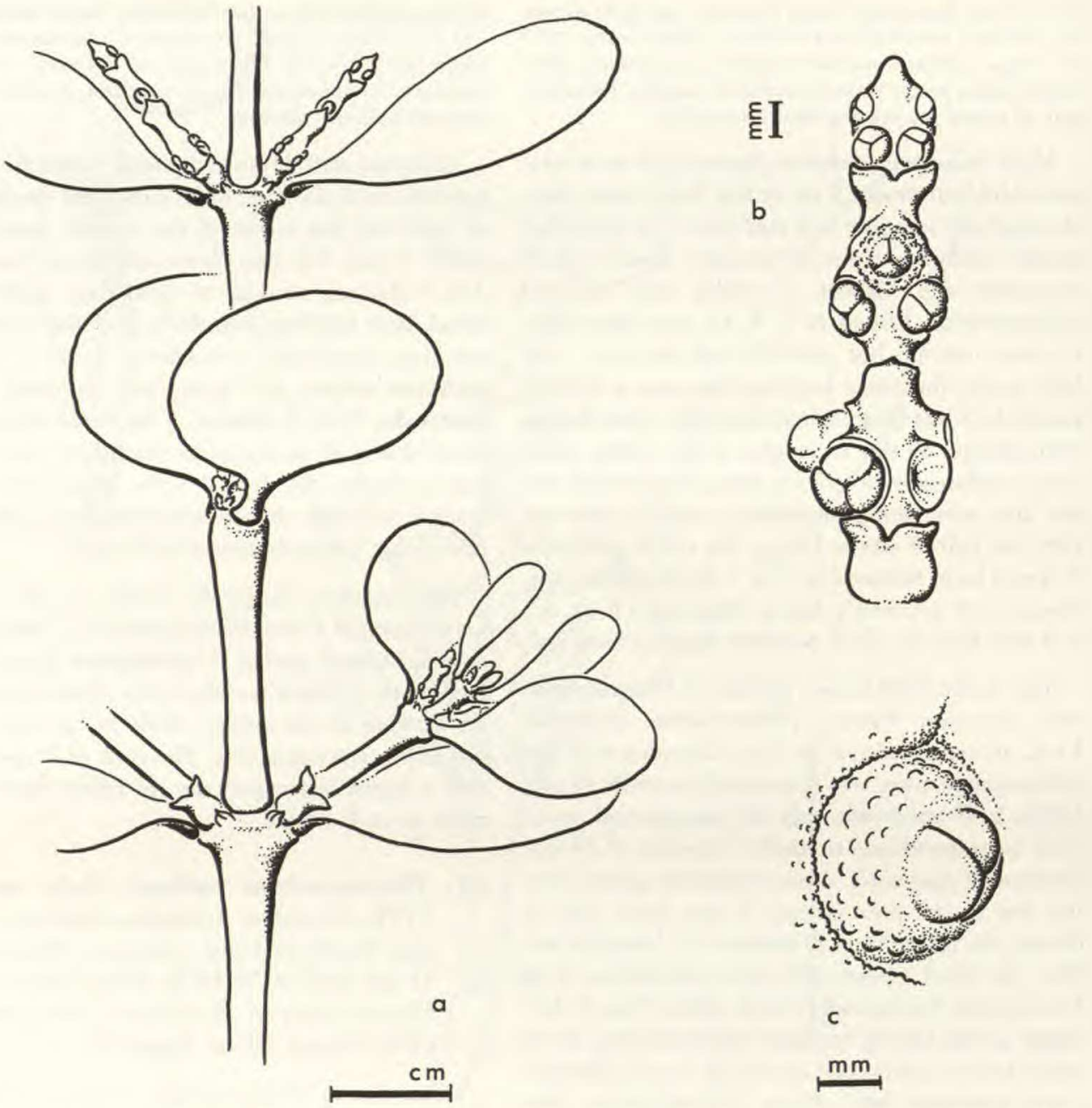

Figure 7. *Phoradendron kingii* Kuijt. —a. Habit. —b. Inflorescence. —c. Young fruit, showing tubercular surface. (*King 3027*, NY.)

ers per bract), biseriate or triseriate even on the same inflorescence. Female inflorescence and fruit not known.

An exceedingly distinctive species because of the excessively clavate internodes and small leaves, *Phoradendron roldanii* is a close relative of *P. piperoides* and *P. tardispicum* Kuijt, especially the latter.

32. Phoradendron triflorum E. Kellogg, sp. nov. TYPE: Venezuela. Bolívar: región de los ríos Icabaru, Hacha, y cordillera sin nombre, cabeceras del Río Hacha, 450–850 m, *Bernardi 2798* (holotype, NY). Figure 9.

Planta inflorescentiis fere moniliformibus internodis contractis infra superque flores, ramis bifurcis, apicibus abortivis. A *Phoradendro mucronato* (DC.) Krug & Urban et *P. tetragono* Ule internodis longioribus (ad 6 cm longis) et fructibus nontuberculatis, a *P. dichotomo* (Bertero) Krug & Urban et *P. northropiae* Urban floribus tantum tres difert.

Stems quadrangular when young, internodes becoming terete with age; branching consistently bifurcate, the apex aborting; cataphylls one pair just above each internode, annular to very broadly triangular, partially fused. Leaves with petiole ca. 5 mm long; blades ovate to oblanceolate, 2.1–4.5 × 1.4–2.8 cm, the apex rounded, obtuse or emarginate, the base cuneate, the nerves obscure but apparently pinnate. Plants monoecious; inflorescences terminal and axillary, to 2.5 cm long, the axis 1–2 mm thick when dry with golden sheen; cataphylls 1 (2) pair(s), fused to form a narrow tube, ca. 1 mm

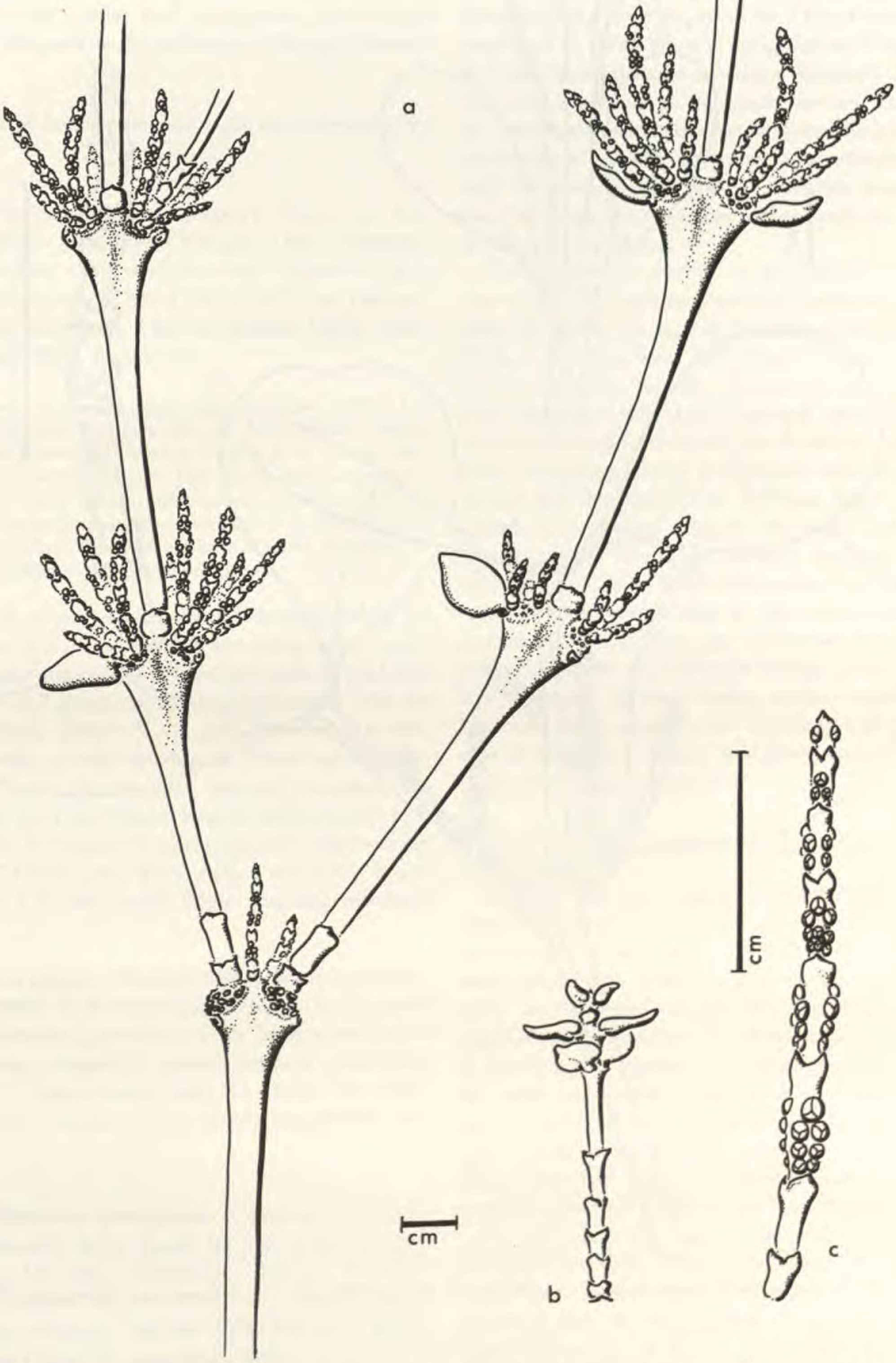

Figure 8. *Phoradendron roldanii* Kuijt. —a. Habit. —b. Young lateral innovation showing five pairs of basal cataphylls. —c. Inflorescence. (*Roldán et al. 861*, LEA.)

Figure 9. *Phoradendron triflorum* Kellogg. —a. Habit. —b Young dichotomy. —c. Inflorescence. (*Bernardi 2798,* NY.)

high; bracts fused and narrowly infundibular; fertile internodes 5 or 6, narrowed and elongate above and below the flower-bearing part, the latter slightly swollen so that inflorescence appears somewhat moniliform in outline; flowers consistently in triangular groups of 3 over each bract, deeply sunken in rachis, apical flower staminate, lower two pistillate, the apical flower with the median perianth member lowermost, the lower two with median perianth member uppermost. Fruits globose when immature; mature color not recorded; perianth members spreading. Rainforests and savannas, 400–900 m.

Phoradendron triflorum is a distinctive species, superficially similar to *P. tetragonum*, but without warty fruits and with consistently bifurcate branching.

Paratype. Locality the same as the type, *Bernardi 2791* (NY).

33. Phoradendron websteri Kuijt, sp. nov. TYPE: Panama. Chiriquí: Distr. Boquete, thickets along road from Alto Boquete to Bajo Volcancito, 82°26–27′W, 8°46′N, on *Conostegia xalapensis*, 1100 m, *Webster 16650* (holotype, MO). Figure 10.

Caules novelli complanato-carinati, deinde teretes. Cataphylla basalia 2–7-juga, per cm 1–2 inferiores teretes ramorum lateralium dispersa. Lamina 6 × 1.5 cm, lanceolata ad anguste ovatam, basi acuta, apice anguste rotundata. Planta dioecia; inflorescentia pistillata ad 4 cm longa, internodiis basalibus sterilibus 2–5, fertilibus ca. 7; flores (singuli vel) terni pro bractea fertili. Fructus 3 × 2 mm, ovoideus, perianthium clausum.

Young stems compressed and sharply keeled, internodes to 4 cm, eventually becoming terete; squamate basal internodes of branches terete. Basal cataphylls 2–7 pairs, spread over the lowest 1–2 cm of branches. Blades 6 × 1.5 cm, lanceolate to narrowly ovate, petiole slender, ca. 5 mm, tapering into acute base of blade; apex narrowly rounded. Dioecious, the type female. Female inflorescence to 4 cm, with 2–5 basal sterile internodes followed by about 7 fertile ones; flowers (1) 3 per fertile bract. Fruit 3 × 2 mm, ovoid, white, perianth members closed.

At first glance, *Phoradendron websteri* is remarkably similar to *P. woodsonii* Trelease. In *P. woodsonii*, however, percurrent stems have a number of intercalary cataphylls placed between successive pairs of foliage leaves, and the stems are terete throughout, features which clearly separate the two entities.

34. Phthirusa podoptera (Chamisso & Schlechtendal) Kuijt, Taxon 43: 198. 1994. Basionym: *Loranthus podopterus* Chamisso & Schlechtendal, Linnaea 3: 218. 1828. TYPE: Brazil. Prov. Alagoas: *Gardner 1330* (neotype, designated here, P; isoneotype, NY).

Loranthus pterygopus Martius, in Schultes f., Syst. Veg. 7: 155. 1829. Syn. nov. *Struthanthus pterygopus* (Martius) Martius, Flora 13: 105. 1830. TYPE: Brazil. In prov. Minarum campis Taboleiro inter fl. Rio Verde et S. Francisci, *Martius s.n.* (lectotype, designated by Kuijt (1994), M).

This unmistakable species has been known as *Struthanthus pterygopus* since the *Flora Brasiliensis* treatment in 1868, but it is clear that the Chamisso & Schlechtendal name antedates Martius's epithet and that it belongs to the same species. There is no other continental member of Loranthaceae that possesses a winged inflorescence peduncle; the only other neotropical species with this feature is the Caribbean *Dendropemon alatus* Tieghem, which is not directly related.

The anther morphology of this unique species was apparently misinterpreted in Eichler's (1868) plate 25. While the type of *Loranthus pterygopus* at M does not allow floral dissection, the species cannot be mistaken, and the identity of the material here illustrated (Fig. 11) is beyond question. Stamens are strongly dimorphic, the 4-celled lower anthers comparing closely to Eichler's representation except that the filament in Eichler's figure corresponds to a median ridge of the petal below the sessile anther. The upper anthers, however, have only 2 pollen sacs, below which deep excavations exist in what presumably is the fused filament; around the excavation are somewhat tubercular cells. In contrast to Eichler's drawings, there are no free filaments. In other words, anther morphology leaves no doubt that we are concerned with a species of *Phthirusa*, unique in either genus through its broadly flanged peduncle.

35. The *Phthirusa stelis* (L.) Kuijt problem.

Probably the most ubiquitous of all South American Loranthaceae is what has in recent years been known as *Phthirusa retroflexa* (Ruiz & Pavón) Kuijt and, before that, under a great variety of names such as *Phthirusa adunca* (Meyer) Maguire, *P. magdalenae* (Chamisso & Schlechtendal) Eichler, *P. theobromae* (Schultes f.) Eichler, etc. It is also the most troublesome species from a taxonomic point of view, because it is extremely variable. The main variables appear to be leaf size and shape, flower size, and degree of branching of the inflorescence. The leaf blade varies from broadly ovate with nearly truncate base to narrowly lanceolate with attenuate apex (Peru. Amazonas: *Woytkowski 8183*, MO). Flower size, even within one sex, is extremely diverse, ranging from 2 mm (Venezuela. Zulia: *Steyermark et al. 123214*, MO) to 7 mm (*Woytkowski 8183*, MO). Perhaps the most striking and difficult variable is the degree of branching of the inflorescence. My impression is that the tip of the shoot always bears a compound inflorescence, but herbarium specimens are often incomplete in this respect, and it is impossible to be certain.

Figure 10. *Phoradendron websteri* Kuijt, habit. (*Webster 16650*, MO.)

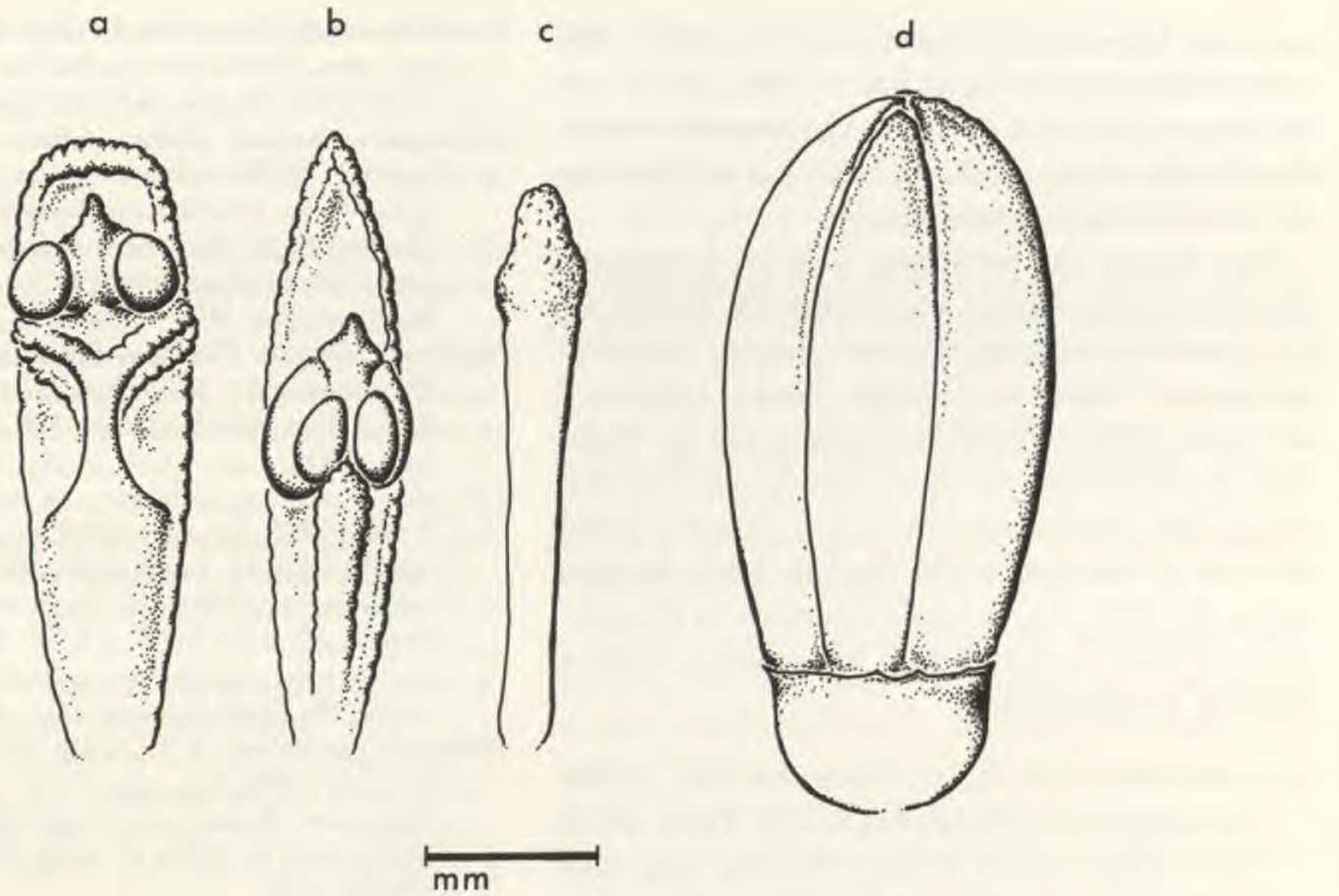

Figure 11. *Phthirusa podoptera* (Chamisso & Schlechtendal) Kuijt, male. —a, b. Dimorphic petals and stamens. —c. Style. —d. Mature bud. (*Maguire et al. 37480,* MO.)

Some specimens have axillary inflorescences that are simple throughout, others have only branched axillary ones, and many have both, the branched inflorescence being near the terminal, compound one. Occasionally, the terminal inflorescence is to 20 cm long, with 6 pairs of lateral branches, of which the lowest may again be branched (*Steyermark et al. 123109,* MO). It may well be that the vigor of the plant, perhaps through the suitability of the host, determines some of these features and that they have little taxonomic significance. Geographically, the complex ranges from Costa Rica and western Panama (where rare) throughout northern and central South America, into southern Brazil and Amazonian Bolivia; on the Pacific slopes, the plants may be encountered from southern Ecuador northward. They occur in lower and middle elevations, but occasionally grow at elevations up to 1400 m, as in the Cerro Duida region. The species seems equally at home in the crowns of undisturbed forest trees and on cultivated woody plants, where it often constitutes a serious pest.

It is not surprising that such a wide-ranging and variable complex has spawned a towering synonymy. The genus *Phthirusa* has never been monographed, and this synonymy has therefore never been sorted out.

I have, over the past 20 years, inspected the majority of specimens belonging to this complex in the major herbaria of Western Europe and the United States, including many of the types involved. The above variables, even in combination, seem not to show any morphological or geographical discontinuities; rather, they appear to show a complete continuum. I have thus reached the conclusion that the only reasonable way to treat these plants is conservatively, as a single species. I cannot exclude the possibility that more detailed future work, including extensive floral dissections, might lead to the recognition of discontinuities, but I am convinced that any subdivisions thus resulting could be assigned an infraspecific rank.

Granted that the complex can be visualized as a single though polymorphic species, the question of nomenclature arises. The oldest name by far in the complex is *Loranthus stelis* L., a name that has been virtually ignored since its appearance in 1762. Its protologue is sparse, indeed (Linnaeus, 1762):

> 5. LORANTHUS racemis trichotomis, pedunculatis trigonis, floribus aequalibus. *Loefl.it.*187. *Habitat in* Cumanae *arboribus.*

Loefling, in the *Iter Hispanicum* to which Linnaeus refers, does not use a binomial, but appears to use *Stelis* as a generic name. Since he seems to equate it with *Loranthus* and perhaps even *Scurrula,* however, it is difficult to think of *Stelis* as a valid generic name. Linnaeus, therefore, is to be regarded as the authority of *Loranthus stelis.*

A holotype or neotype does not appear to exist. Fred Barry (MO, pers. comm.) states that no American Loefling specimens are known, and none are

known to have reached Linnaeus. "*Loranthus* #3" in the Linnaean *Catalogue* has no data, and it can therefore not be used as a type specimen no matter what its identity is. As far as I know, a neotype has not been previously designated.

Even though the protologue is brief, it contains one pivotal element that leaves little doubt that we are concerned with the present species: "*racemis trichotomis.*" There is no other known species of any small-flowered loranthaceous genus in Venezuela in which this type of compound inflorescence occurs. The present species is also the most abundant one in that part of the country. I see no other option, therefore, but to apply this name to the complex and have recently made the requisite recombination, as cited below.

Phthirusa stelis (L.) Kuijt, Taxon 43: 193. 1994. Basionym: *Loranthus stelis* L., Sp. Plant. ed. 2, 231, 1762, non G. Forster. *Struthanthus stelis* (L.) Blume, in Schultes f., Syst. Veg. 7(2): 1731. 1830. TYPE: Panama. Panamá: seaside just W of Vera Cruz, sea level, on *Laguncularia racemosa, Hammel 3298* (neotype (male plant), designated here, MO; isoneotype, LEA).

Phthirusa abdita Moore, Trans. Linn. Soc. London, Ser. 2, 4: 450–451. 1895. Syn. nov. TYPE: Brazil. Mato Grosso: *Moore 594* (holotype, NY; isotype, P).

Phthirusa adenostemon Eichler, Fl. Brasil. 5(2): 58, Figure 14: 2. 1868. Syn. nov. TYPE: Brazil. Prope Panuré ad Rio Vaupes, *Spruce 2906* (holotype, BR; isotype, P).

Phthirusa adenostemon Eichler var. *huberi* Rizzini, Dusenia 3: 458. 1952. TYPE: Brazil. Pará: Arumanduba, Miritizal, *Ducke s.n.* (MG?).

Loranthus aduncus Meyer, Prim. Fl. Esseq. 149. 1818. Syn. nov. *Phthirusa adunca* (Meyer) Maguire, Bull. Torrey Bot. Club 75: 301. 1948. TYPE: not designated.

Phthirusa adunca (Meyer) Maguire fo. *magnifolia* Rizzini, Fl. Venezuela 4(2): 81. 1982. Syn. nov. TYPE: Venezuela. Miranda: Vista Linda, en las cabeceras del río Guarita, 1100 m, *Steyermark & Berry 111889* (VEN?).

Loranthus avicularius Martius in Schultes f., Syst. Veg. 7: 132. 1829. Syn. nov. TYPE: not designated.

Phthirusa caucana Eichler, Fl. Brasil. 5(2): 60. 1868. Syn. nov. TYPE: Colombia. Cauca: near La Paita, *Holton 651* (in the protologue, only *Holton s.n.* is given) (isotype, P).

[*Comments.* Eichler's name is only a provisional one, and is therefore not legitimate by itself. I here include the name, in case a later listing, not known to me, of the species exists elsewhere, which would legitimize Eichler's name; it is here not accepted or legitimized.]

Phthirusa cochliostylus Ule, Notizbl. Bot. Gart. Berlin 6: 288. 1915. Syn. nov. TYPE: Brazil. Amazonas: Rio Branco, Serra de Mairarí, 900 m, *Ule 8385* (holotype, B destroyed; Field Museum Neg. #11790).

Loranthus conduplicatus Kunth, Nov. Gen. 3: 441. 1820. Syn. nov. TYPE: Venezuela. Sucre: Cumaná, *Humboldt 199* (holotype, B-W; isotype, P).

Phthirusa cothurnata Rizzini, Ernstia 24: 16–17. 1984. Syn. nov. TYPE: Venezuela. Amazonas: Depto. Tucupita, Caño Jota-Sabuca, between Laguna del Consejo and Caño Mariusa, N of Río Grande of Río Orinoco, 50 m, *Steyermark et al. 115315* (holotype, RB?; isotypes, MO, VEN).

Phthirusa elongata Gleason, Bull. Torrey Bot. Club 58: 357, Figure 4c. 1931. Syn. nov. TYPE: Venezuela. Esmeralda: Middle Camp, 500 ft., *Tate 946* (holotype, NY).

Loranthus erythrocarpus Martius in Schultes f., Syst. Veg. 7: 138. 1829. Syn. nov. *Phthirusa erythrocarpa* (Martius) Eichler, Fl. Brasil. 5(2): 58–59. 1868. *Passowia erythrocarpa* (Martius) Tieghem, Bull. Soc. Bot. France 42: 172. 1895. TYPE: Brazil. Alto Amazonas: in sylvis montis Arara-Coaras, *Martius s.n.* (holotype, M; Field Museum Neg. #19046).

Phthirusa gonioclada A. C. Smith, Bull. Torrey Bot. Club 59: 515. 1932. Syn. nov. TYPE: Colombia. Norte de Santander: W side of Culugá Valley, N of Labateca, 1480–1550 m, *Killip & Smith 20537* (holotype, NY; isotype, GH).

Phthirusa krukovii A. C. Smith, Brittonia 2: 146. 1936. Syn. nov. TYPE: Brazil. Pará: near Bocca do Paru, *Krukoff 5938* (holotype, NY; isotypes, F, GH).

Loranthus magdalenae Chamisso & Schlechtendal, Linnaea 3: 219. 1828. Syn. nov. *Phthirusa magdalenae* (Chamisso & Schlechtendal) Eichler, Fl. Brasil. 5(2): 55. 1868. *Passowia magdalenae* (Chamisso & Schlechtendal) Tieghem, Bull. Soc. Bot. France 42: 172. 1895. TYPE: *Bertero s.n.* ("vermutlich eine Pflanze von Bertero . . .") (holotype, M).

Phthirusa maritima Rizzini, Rev. Fac. Agron. Maracay 8(3): 92. 1975. Syn. nov. TYPE: Venezuela. Falcón: Distr. Silva, coral island near Cayo Borracho & Caño Ramadita, *Steyermark & Manara 110306* (holotype, RB?).

Passowia odorata Karsten ex Klotsch in Schlechtendal, Bot. Zeits. 10: 305. 1852. Syn. nov. TYPE: not designated.

Loranthus orinocensis Sprengel, Syst. 2: 129. 1825. Syn. nov. *Phthirusa orinocensis* (Sprengel) Eichler, Fl. Brasil. 5(2): 60. 1868. *Passowia orinocensis* (Sprengel) Tieghem, Bull. Soc. Bot. France 42: 172. 1895. *Phthirusa adunca* (Meyer) Maguire var. *orinocensis* (Sprengel) Steyermark, Fieldiana, Bot. 28: 224. 1951. TYPE: not designated.

Loranthus paniculatus Kunth, Nov. Gen. 3: 442. 1820. Syn. nov. *Phthirusa paniculata* (Kunth) Macbride, Publ. Field Mus. Nat. Hist. Bot. Ser. 11: 17. 1931. TYPE: Venezuela. Sucre: Cumaná, *Humboldt 32* (holotype, P).

Phthirusa papillosa Pilger, Bot. Jahrb. Syst. 33, Beibl. 72: 15. 1903. Syn. nov. TYPE: Brazil. "Goyas": *Glaziou 22022* (lectotype, here designated, P).

Phthirusa polystachya Eichler, Fl. Brazil. 5(2): 57–58, Figure 19-3. 1868, non *Struthanthus polystachyus* (Ruiz & Pavón) Blume (a native of Peru). Syn. nov. TYPE: Brazil. Pará: Serras de Santarém, *Spruce 1018* (holotype, P; isotype, NY).

Phthirusa punctata Gleason, Bull. Torrey Bot. Club 58: 359, Figure 4. 1931. Syn. nov. TYPE: Venezuela. Savanna Hills, S bank of Caño Negro, 4400 ft., on *Archytaea multiflora* Bentham, *Tate 853* (holotype, NY).

Loranthus retroflexus Ruiz & Pavón, Fl. Peruv. Chil. 3: 49–50, t. 279b. 1802. Syn. nov. *Phthirusa retroflexa* (Ruiz & Pavón) Kuijt, Brittonia 32: 521–522. 1980. *Struthanthus retroflexus* (Ruiz & Pavón) Blume in Schultes f., Syst. Veg. 7: 1731. 1830. TYPE: Peru, *Pavón s.n.* (isotype, MO).

Phthirusa seitzii Krug & Urban, Bot. Jahrb. Syst. 24: 16. 1897. Syn. nov. TYPE: Tobago, *Eggers 5521* (holotype, P; isotypes, M, P).

Loranthus theobromae Schultes f., Syst. Veg. 7: 132. 1829. Syn. nov. *Phthirusa theobromae* (Schultes f.) Eichler, Fl. Brasil. 5(2): 56–57. 1868. *Passowia theobromae* (Schultes f.) Tieghem, Bull. Soc. Bot. France 42: 172. 1895. *Phthirusa theobromae* (Schultes f.) Eichler fo. *parvifolia* Eichler, Fl. Brasil. 5(2): 57. 1868. TYPE: Brazil. Prov. "Piauhy": *Gardner 2181a* (P).

Phthirusa tortuosa A. C. Smith, Bull. Torrey Bot, Club 59: 514–515. 1932. Syn. nov. TYPE: Colombia. Huila: Río Cabrera to Villavieja, 500–550 m, *Rusby & Pennell 377* (holotype, NY; isotype, GH).

Loranthus virgatus Martius, in Schultes f., Syst. Veg. 7: 132. 1829. Syn. nov. *Phthirusa virgata* (Martius) Eichler, Fl. Brasil. 5(2): 55–56. 1868. TYPE: Brazil. Rio Negro, *Martius s.n.* (holotype, M; Field Museum Neg. #19052).

The type of *Loranthus theobromae* possibly is #6945 at B-W (holotype ?), which is very badly fragmented but belongs to *P. stelis*; otherwise as neotype: Brazil. Prov. Rio Negro, in sylvis Yapurensibus, *Martius s.n.* (holoneotype, M).

In addition to the names listed above, and the possibility of several more later Rizzini names of which I have not seen the types (*P. anastyla* Rizzini, *P. pedicularis* Rizzini, and *P. pyramidalis* Rizzini), there are two more that might have to be added eventually. I cannot at present be certain whether they represent taxa sufficiently different to warrant continued separation, but list them here for the sake of completeness:

Phthirusa ovata (DC.) Eichler, Fl. Brasil. 5(2): 60–61. 1868. *Loranthus ovatus* DC., Prodr. 4: 315. 1830. *Passowia ovata* (DC.) Tieghem, Bull. Soc. Bot. France 42: 172. 1895. TYPE: Brazil. Prov. "Goyas": prope S. Rita ad fluvium Bagagem, *Pohl s.n.* (holotype, M; Field Museum Neg. #19050).

Phthirusa ovata (DC.) Eichler var. *nemorosa* Rizzini, Arq. Jard. Bot. Rio de Jan. 24: 26. 1980. TYPE: Brazil. D.F., Brasilia, Catetinho, *Heringer 14872* (holotype, RB; isotype, NY).

Phthirusa robusta Rusby, Bull. New York Bot. Gard. 6: 501. 1910. TYPE: Bolivia. Santa Cruz: 5000 ft., *Williams 1503* (holotype, NY).

There are two specimens at P, both undoubtedly *P. stelis*, labeled "S. Thomas," "1841" (*Finlay 77, 95*). An annotation label in both cases seems to question the locality. The island, just east of Puerto Rico, would be an exceedingly surprising station for both species, and the records may be assumed to be in error.

36. Psittacanthus breedlovei Kuijt, sp. nov. TYPE: Mexico. Chiapas: slope with tropical deciduous forest 10–15 km W of Ocozocoautla on road to El Ocote, 880 m, on *Acacia, Breedlove 70607* (holotype, CAS). Figure 12.

Plantae minores, glabrae; folia usque ad 5.5 × 0.7 cm, angustissime lanceolata. Inflorescentia racemosa, e triadis ca. 6 binis ad axem 1–1.5 cm longam insertis consistens, pedunculus triadae 1–1.5 cm longus, bracteis acicularibus 5–6 mm longis; pedicelli 10–12 mm longi. Alabastrum (cum ovario) 6 cm longum, rectum, aurantiacum. Stamina dimorpha; filamenta ca. 2.5 cm supra basem petali inserta; anthera 2.5–3.5 mm longa, in sulco dorsali profundo dorsifixa; ligulae carentes.

Rather small, glabrous plants, internodes short (to 2 cm); axillary buds flanked by two compressed or naviculate, yellowish prophylls 0.5 mm long. Leaves to 5.5 × 0.7 cm, extremely narrowly lanceolate, with long-attenuate apex and base, petiole indistinct, ca. 5 mm long, venation obscure. Inflorescence a raceme of ca. 6 paired triads crowded on axis 1–1.5 cm long; triad peduncle 1–1.5 cm, its bract 5–6 mm long, acicular; pedicels 10–12 mm long, beyond which a somewhat expanded cupule 4 mm wide, in the case of lateral flowers with a marginal bracteole 1 mm long. Flower bud (including ovary) 6 cm long, straight, angular, orange; ovary 2 × 2 mm, mostly hidden by cupule, crowned by flaring, irregularly dentate calyculus 2 mm long. Stamens dimorphic, filaments inserted ca. 2.5 cm above base of petal, 23 and 26 mm long, slightly sinuous below anthers; anther 2.5–3.5 mm long, dorsifixed in a deep dorsal groove; ligules absent; style nearly the length of the petals, straight, stigma capitate, small. Fruit unknown.

There is no other known species of *Psittacanthus* that shows such an extraordinary, terminally proliferating inflorescence, as *P. breedlovei* apparently does. The evidence of this growth pattern, which I consider rather compelling, does not just lie in the unusually well developed terminal bud of the inflorescence. More importantly, it revolves around the scars such as those indicated by the arrow in Figure 12a and c. These scars are much crowded together, as the triads in the present inflorescences. Furthermore, they show no evidence of the prophylls that might otherwise be expected. I know of no other member of Loranthaceae that shows such inflorescences, except occasionally *Tristerix aphyllus* (DC.) Barlow & Wiens (Kuijt, 1981, fig. 9: 1). It should be understood that this is a situation morphologically very different from that in, for example, *P. pinicola* and *P. ramiflora*, where full-fledged inflorescences develop in the axils of leaves. The triads of *P. breedlovei* do not develop in the axil of

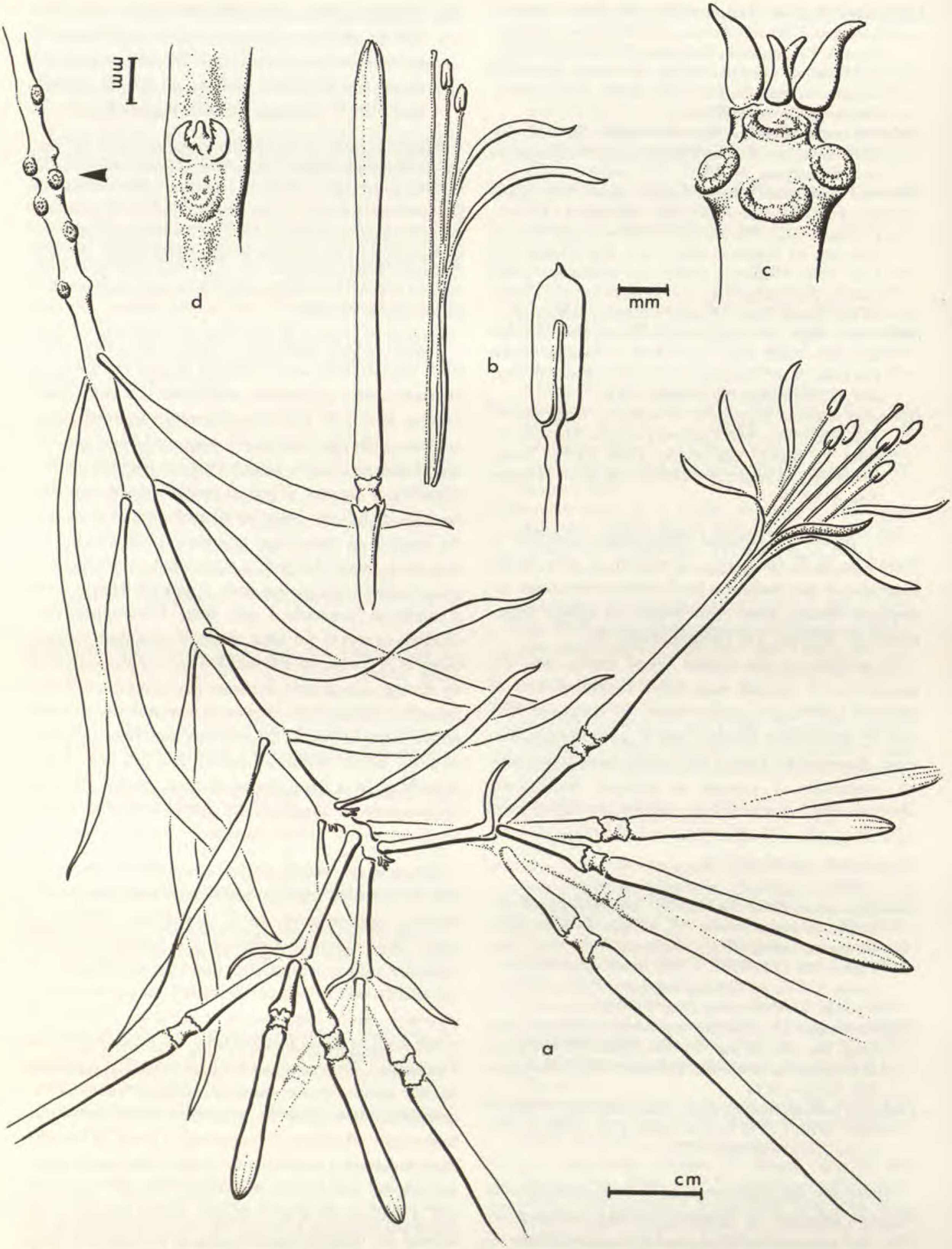

Figure 12. *Psittacanthus breedlovei* Kuijt. —a. Habit. The arrow indicates the presumed previous inflorescence area. —b. Bud, floral elements, and anther. —c. Inflorescence apex showing apical bud and triad scars, the latter lacking prophylls. —d. Leaf scars and associated pair of prophylls. (*Breedlove 70607*, CAS.)

any leafy organ; the foliar organ in that position is the primary bract, which is fused along the length of the triad peduncle and is recognizable at the latter's end.

The other morphological feature worthy of mention is the prominence of the prophylls (Fig. 12d). These structures are recognizable in the young shoots of other species also, as in *Psittacanthus schiedeanus* (Chamisso & Schlechtendal) Blume, but are rarely as prominent. In the present species they are compressed between the petiolar base and the stem, but separate widely when the axillary bud develops. Morphologically, they might be homologous with the bracteoles associated with the cupules of lateral flowers.

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